

# 802.1x Configuration Commands

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## Chapter 1 802.1x Configuration Commands

### 1.1 802.1x Configuration Commands

802.1x configuration commands include:

- dot1x enable
- dot1x port-control
- dot1x authentication multiple-hosts
- dot1x authentication multiple-auth
- dot1x default
- dot1x reauth-max
- dot1x re-authentication
- dot1x timeout quiet-period
- dot1x timeout re-authperiod
- dot1x timeout tx-period
- dot1x mab
- dot1x mabformat
- dot1x user-permit
- dot1x authentication method
- dot1x accounting enable
- dot1x accounting method
- dot1x authen-type、dot1x authentication type
- dot1x guest-vlan
- dot1x guest-vlan id
- dot1x forbid multi-network-adapter
- dot1x keepalive
- dot1x vendor-permit
- dot1x vendor
- aaa authentication dot1x

- debug dot1x error
- debug dot1x state
- debug dot1x packet
- show dot1x

### 1.1.1 dot1x enable

#### Syntax

To enable 802.1x, run the following command.

**dot1x enable**

To return to the default setting, use the no form of this command.

**no dot1x enable**

#### Parameters

None

#### Default Value

None

#### Command Mode

Global configuration mode

#### Usage Guidelines

If the 802.1x function is not enabled, you cannot start it on an interface. If the 802.1x function is forbidden, all interfaces have no the 802.1x function, and at the same time, all 802.1x packets will not be received by CPU but can be forwarded in VLANlike normal multicast packets.

#### Command Mode

Global configuration mode

#### Example

The following example shows how to enable dot1x.

Switch\_config#dot1x enable

---

Switch\_config #

### 1.1.2 dot1x port-control

#### Syntax

To configure the port based authentication mode, run the following command:

**dot1x port-control {auto|force-authorized|force-unauthorized}**

To return to the default setting, use the no form of this command.

**no dot1x port-control**

#### Parameters

Parameters	Description
<b>auto</b>	Enables the 802.1x authentication mode.
<b>force-authorized</b>	Disables 802.1X on the interface and causes the port to change to the authorized state without any authentication exchange required.
<b>force-unauthorized</b>	Denies all access through this interface by forcing the port to change to the unauthorized state, ignoring all attempts by the client to authenticate.

#### Default Value

force-authorized

#### Command Mode

Interface configuration mode

#### Usage Guidelines

The 802.1x protocol is an interface-based two-layer authentication mode. You can run the auto command to enable the authentication mode. This authentication mode can be configured only on the physical interface and the interface's attributes cannot include VLAN backbone, dynamical access, security port or listening port.

The command is not supported in the PON port.

#### Command Mode

Port configuration mode

## Example

The following example shows how to enable 802.1x on interface g0/1.

```
Switch_config _g0/1# dot1x port-control auto
```

The following example shows how to firstly set interface g0/1 to the VLAN backbone and then enable 802.1x.

```
Switch_config _g0/1#switchport mode trunk
```

```
Switch_config _g0/1#dot1x port-control auto
```

```
802.1x Control Failed, can't config 802.1x on vlanTrunk port(GigaEthernet0/1)
```

### 1.1.3 dot1x authentication multiple-hosts

#### Syntax

To configure multi-host access mode of 802.1x, run the following command:

**dot1x authentication multiple-hosts**

To return to the default setting, use the no form of this command.

**no dot1x authentication multiple-hosts**

#### Parameters

None

#### Default Value

Disabled

#### Usage Guidelines

Set one port to the multi-hosts mode of 802.1x, and the switch will authenticate different users. When one user passes the authentication, the port sets to the “up” state. Other users can access the port without authentication.

Note: After modifying the multi-host authentication mode, all users of the port will be authenticated again.

#### Command Mode

Port configuration mode

## Example

The following example shows how to enable multi-hosts authentication on interface g0/1.

```
Switch_config _g0/1# dot1x authentication multiple-hosts  
Switch_config _g0/1#
```

### 1.1.4 dot1x authentication multiple-auth

#### Syntax

To configure multiple-auth authentication mode of 802.1x, run the following command:

**dot1x authentication multiple-auth**

To return to the default setting, use the no form of this command.

**no dot1x authentication multiple-auth**

#### Parameters

None

#### Default Value

Disabled

#### Command Mode

Interface configuration mode

#### Usage Guidelines

Set one port to the multi-hosts mode of 802.1x, and the switch will authenticate different users. When only one user passes its authentication, the interface will be up; only when all users fail in their authentication, in another word, only when no successfully authenticated user exist on the interface, the interface will be down. This mechanism gives guarantee to respective authentication for each user and if a user fails in its authentication, other users still have the normal access rights.

Note: The multi-auth mode cannot coexist with guest vlan or mab. If an interface is in multi-auth mode, all users on the interface will be authenticated again.

#### Command Mode

Port configuration mode

## Example

The following example shows how to enable multi-auth authentication on interface g0/1.

```
Switch_config _g0/1# dot1x authentication multiple-auth  
Switch_config _g0/1#
```

### 1.1.5 dot1x default

#### Syntax

To return to the default setting, run the following command.

**dot1x default**

#### Parameters

None

#### Default Value

None

#### Usage Guidelines

This command is used to resume all global configurations to the default settings.

#### Command Mode

Global configuration mode

## Example

The following example shows how to resume all dot1x configuration parameters to their default values.

```
Switch_config #dot1x default  
Switch_config #
```

### 1.1.6 dot1x reauth-max

#### Syntax

To configure the times of re-authentication, run the following command:

**dot1x reauth-max count**

To return to the default setting, use the no form of this command.

#### **no dot1x reauth-max**

##### Parameters

Parameters	Description
<i>count</i>	Maximum authentication re-try times, ranging between 1 and 10

##### Default Value

5

##### Command Mode

Global configuration mode

##### Usage Guidelines

This command is used to set the authentication retry times. If the retry times exceeds the maximum retry times and the client has no response, the authentication is mounted.

##### Command Mode

Global configuration mode

##### Example

The following example shows how to configure the maximum times of dot1x identity authentication request to 4.

```
Switch_config #dot1x reauth-max 4
Switch_config #
```

## 1.1.7    dot1x re-authentication

##### Syntax

To enable re-authentication, run the following command:

#### **dot1x re-authentication**

To disable re-authentication, run the following command:

#### **no dot1x re-authentication**

## Parameters

None

## Default Value

None

## Command Mode

Global configuration mode

## Usage Guidelines

After an interface passes authentication, the interface will still perform authentication to hosts in a certain period. You can run `dot1x timeout re-authperiod` to configure the period.

## Example

The following example shows how to enable the re-authentication function.

```
Switch_config #dot1x re-authentication
Switch_config #
```

## 1.1.8 dot1x timeout quiet-period

### Syntax

To configure the quiet-period after the authentication failure, run the following command:

**dot1x timeout quiet-period *time***

To return to the default setting, use the no form of this command.

**no dot1x timeout quiet-period**

## Parameters

Parameters	Description
<i>time</i>	Period for restarting dot1x authentication, ranging between 0 and 65535 seconds

## Default Value

60s

## Command Mode

Global configuration mode

### Usage Guidelines

There is a certain period when the OLT cannot perform any authentication after the previous authentication fails.

### Example

The following example shows how to set the value of quiet-period to 40.

```
Switch_config #dot1x timeout quiet-period 40
Switch_config #
```

## 1.1.9 dot1x timeout re-authperiod

### Syntax

To configure the re-authentication period of dot1x, run the following command:

**dot1x timeout re-authperiod *time***

To return to the default setting, use the no form of this command.

**no dot1x timeout re-authperiod**

### Parameters

Parameters	Description
<i>time</i>	dot1x re-authentication period, ranging between 1 and 4294967295s

### Default Value

3600s

## Command Mode

Global configuration mode

### Usage Guidelines

This command validates only when the re-authentication function is enabled.

## Example

The following example shows how to set the dot1x re-authentication period to 7200 seconds.

```
Switch_config # dot1x timeout re-authperiod 7200
Switch_config #
```

### 1.1.10 dot1x timeout tx-period

#### Syntax

To configure the time interval of the host client responses to the authentication request, run the following command:

**dot1x timeout tx-period *time***

To return to the default setting, use the no form of this command.

**no dot1x timeout tx-period**

#### Parameters

Parameters	Description
time	Time which ranges between 1 and 65535 seconds

#### Default Value

30s

#### Command Mode

Global configuration mode

#### Usage Guidelines

This command is used to set the client's authentication request response interval. If the interval is exceeded, the switch would retransmit the authentication request.

#### Example

The following example shows how to set the transmission frequency to 24.

```
Switch_config # dot1x timeout tx-period 24
```

### 1.1.11 dot1x mab

#### Syntax

To enable mab authentication, run the following command:

**dot1x mab**

To return to the default setting, use the no form of this command.

**no dot1x mab**

#### Parameters

None

#### Default Value

The debugging switch is disabled.

#### Usage Guidelines

When a peer device cannot run the 802.1x client software, the OLT will adopt the MAB authentication mode and then the MAC address of the peer device will be sent as both the username and password to the radius server for authentication.

When the MAB authentication is enabled and the peer device, however, neither sends the eapol\_start packet nor responds to the request\_identity packet and exceeds the timeout threshold, the OLT regards this case as the evidence of not support the 802.1x authentication client on the peer device and then turns to the MAB authentication. When the switch sends the gained MAC address as the username and password to the Radius server for authentication, the authentication will still not succeed until the Radius server has authorized this MAC address.

Note: The MAB authentication mode cannot coexist with the multi-auth mode.

#### Command Mode

Port configuration mode

#### Example

The following example shows how to enable mab authentication on port g0/1.

```
Switch_config _g0/1# dot1x mab  
Switch_config _g0/1#
```

### 1.1.12 dot1x mabformat

#### Syntax

To configure the mac address format of OLT forwarding to radius server, run the following command:

**dot1x mabformat {1|2|3|4|5|6}**

To return to the default setting, use the no form of this command.

**no dot1x mabformat**

#### Parameters

Parameters	Description
1	Format of the MAC address: aa:bb:cc:dd:ee:ff
2	Format of the MAC address: aa:bb:cc:dd:ee:ff
3	Format of the MAC address: aabbccddeeff
4	Format of the MAC address: AABBCCDDEEFF
5	Format of the MAC address: aa-bb-cc-dd-ee-ff
6	Format of the MAC address: AA-BB-CC-DD-EE-FF

#### Default Value

The default is 1.

#### Usage Guidelines

When the MAB authentication is enabled, you can set the format of the MAC address to the Radius server through this command.

#### Command Mode

Global configuration mode

#### Usage Guidelines

The command can be used to set the format of the MAC address of OLT forwarding to radius server when enable mab authentication.

#### Example

The following example shows how to set the format of MAC to 3.

---

```
Switch_config # dot1x mabformat 3
Switch_config #
```

### 1.1.13 dot1x user-permit

#### Syntax

To configure the port binding user, run the following command:

**dot1x user-permit xxx yyy zzz**

To return to the default setting, use the no form of this command.

**no dot1x user-permit**

#### Parameters

Parameters	Description
xxx	A user name
yyy	A user name
zzz	A user name

#### Default Value

No user is bound and all users would pass.

#### Command Mode

Port configuration mode

#### Usage Guidelines

This command can be used to bind users on an interface. Each interface can be bound to up to eight users. When the 802.1x authentication is enabled, the authentication is performed only to those bound users. However, to those unbound users, the authentication must fail.

#### Example

The following example shows how to bind users a, b, c and d on interface g0/1.

```
Switch_config _g0/1# dot1x user-permit a b c d
Switch_config _g0/1#
```

### 1.1.14 dot1x authentication method

#### Syntax

To configure the authentication method under the port, run the following command:

**dot1x authentication method xxx**

To return to the default setting, use the no form of this command.

**no dot1x authentication method**

#### Parameters

Parameters	Description
xxx	Method name

#### Default Value

Default method

#### Usage Guidelines

This command is used to configure the authentication method which must be one of authentication methods provided by AAA. One interface only uses one authentication method. When AAA performs authentication to the 802.1x user, AAA would select the configured authentication method to perform the authentication.

#### Command Mode

Port configuration mode

#### Example

The following example shows how to set the authentication method on interface g0/1 to abcd which applies the local username for authentication and that on interface g0/2 to efg which applies the remote radius authentication.

```
Switch_config #aaa authentication dot1x abcd local
Switch_config #aaa authentication dot1x efg group radius
Switch_config _g0/1# dot1x authentication method abcd
Switch_config _g0/1# interface g0/2
Switch_config _g0/2# dot1x authentication method efg
```

### 1.1.15 dot1x accounting enable

#### Syntax

To enable the accounting function under the port, run the following command:

**dot1x accounting enable**

To disable the accounting function under the port, run the following command:

**no dot1x accounting enable**

#### Parameters

None

#### Default Value

The accounting service is disabled by default.

#### Command Mode

Port configuration mode

#### Usage Guidelines

This command is used to enable the accounting function on a port which runs with the authentication function. You'd better enable the dot1x re-authentication function when the accounting function is running.

#### Example

The following example shows how to configure the dot1x authentication function on interface g0/1 and enable the accounting function.

```
Switch_config #dot1x enable  
Switch_config # interface g0/1  
Switch_config _g0/1# dot1x port auto  
Switch_config _g0/1# dot1x accounting enable
```

### 1.1.16 dot1x accounting method

#### Syntax

To configure the accounting method under the port, run the following command:

**dot1x accounting method xxx**

To return to the default setting, use the no form of this command.

#### **no dot1x accounting method**

##### Parameters

Parameters	Description
xxx	Name of the accounting method

##### Default Value

Default method

##### Command Mode

Port configuration mode

##### Usage Guidelines

This command is used to configure an accounting method on a port. This method must be one of the accounting methods provided by AAA. Each port has only one accounting method. When the dot1x accounting function is enabled, this method will be used for accounting.

##### Example

The following example shows how to set the accounting method on interface g0/1 to abcd, which uses the radius server.

```
Switch_config # aaa accounting network abcd start-stop group radius
Switch_config #radius host 192.168.20.100
Switch_config # interface g0/1
Switch_config _g0/1# dot1x accounting method abcd
```

#### 1.1.17   **dot1x authen-type, dot1x authentication type**

##### Syntax

To configure the dot1x authentication type in global configuration mode, run dot1x authen-type; to resume the default settings in global configuration mode, run no dot1x authen-type.

**dot1x authen-type {chap|eap}**

**no dot1x authen-type**

To configure the dot1x authentication type on an interface, run dot1x authentication type; to resume the default settings on an interface, run no dot1x authentication type.

---

**dot1x authentication type {chap|eap}**

**no dot1x authentication type**

#### Parameters

None

#### Command Mode

Interface or global configuration mode

#### Default Value

The default dot1x authentication type is eap.

The default dot1x authentication type in global configuration mode is also used applied by default in interface configuration mode.

#### Usage Guidelines

The authentication type decides whether AAA uses the CHAP authentication or the EAP authentication. If the CHAP authentication is used, the challenge required by MD5 is locally generated; if the EAP authentication is used, the challenge is generated on the authentication server. Only one authentication mode can be applied to one interface. By default, the authentication mode is applied in global mode. When an authentication mode is configured for an interface, the authentication mode will be always used on the interface unless the negative form of the command is run to resume the default settings.

#### Example

The following example shows how to set the authentication type on interface g0/1 to chap and the global authentication type to eap.

```
Switch_config #dot1x authen-type eap
Switch_config # interface g0/1
Switch_config _g0/1# dot1x authentication type chap
```

### 1.1.18    dot1x guest-vlan

#### Syntax

To enable the guest-vlan function of dot1x in global configuration mode, run dot1x guest-vlan. To disable the guest-vlan function of dot1x in global configuration mode, run no dot1x guest-vlan.

**dot1x guest-vlan**

**no dot1x guest-vlan**

## Parameters

None

## Default Value

Disabled

## Command Mode

Global configuration mode

## Usage Guidelines

After the guest-vlan function is enabled, the corresponding port can be grouped into the guest vlan and specific network access rights are attributed to the port if a guest terminal does not respond.

This command is used together with the dot1x guest-vlan id command.

Note: This command cannot be set together with the multiple-auth command.

## Example

The following example shows how to enable guest-vlan in the global configuration mode:

```
Switch_config #dot1x guest-vlan
```

**1.1.19    dot1x guest-vlan id**

## Syntax

To configure the value of dot1x guest-vlan id on an interface, run dot1x guest-vlan id; to resume the default value 0, run no dot1x guest-vlan.

**dot1x guest-vlan id****no dot1x guest-vlan**

## Parameters

ID: stands for the value of guest vlan, which can be any vlan ID configured in the system.

### Default Value

None

### Command Mode

Port configuration mode

### Usage Guidelines

After the guest-vlan function is enabled, the corresponding port can be grouped into the guest vlan and specific network access rights are attributed to the port if a guest terminal does not respond.

This command is used together with the dot1x guest-vlan id command.

Note: This command cannot be set together with the multiple-auth command.

### Example

The following example shows how to configure the guest-vlan id on port g0/1.

```
Switch_config _g0/1#dot1x guest-vlan 2
```

## 1.1.20 dot1x forbid multi-network-adapter

### Syntax

To forbid the supplicant of the multi-network-adapter on an interface, run dot1x forbid multi-network-adapter. To resume the default settings, run no dot1x forbid multi-network-adapter.

**dot1x forbid multi-network-adapter**

**no dot1x forbid multi-network-adapter**

### Parameters

None

### Default Value

None

### Command Mode

Port configuration mode

## Usage Guidelines

This command can be used to forbid the supplicant terminal with multiple network adapters, preventing an agent from being occurred.

## Example

The following example shows how to forbid the supplicant terminal with multiple network adapters on port g0/1.

```
Switch_config _g0/1 # dot1x forbid multi-network-adapter
```

### 1.1.21 dot1x keepalive

#### Syntax

To enable the keepalive detection for the authentication user in the global configuration mode, run the following command. To return to the default setting, use the no form of this command.

**dot1x keepalive**

**no dot1x keepalive**

#### Parameters

None

#### Default Value

Enabled

#### Command Mode

Global configuration mode

## Usage Guidelines

The keepalive detection is enabled by default.

## Example

The following example shows how to enable or disable the keepalive detection for the authentication user.

```
Switch_config #no dot1x keepalive
```

### 1.1.22 dot1x vendor-permit

#### Syntax

To enable vendor forwarding function in the global configuration mode, run the following command. To return to the default setting, use the no form of this command.

**dot1x vendor-permit**

**no dot1x vendor-permit**

#### Parameters

None

#### Default Value

The debugging switch is disabled.

#### Command Mode

Global configuration mode

#### Usage Guidelines

The command is used to enable vendor forwarding function. The command enables the switch forwards vendor information to the radius authentication server during the authentication. The command is disabled by default.

The command is used with dot1x vendor command.

#### Example

The following example shows how to enable the vendor forwarding function in global configuration mode.

Switch\_config #dot1x vendor-permit

### 1.1.23 dot1x vendor

#### Syntax

To set vendor information provided by radius server, run the first one of the above commands. To return to the default setting, use the no form of this command.

**dot1x vendor word**

**no dot1x vendor**

## Parameters

Parameters	Description
<i>word</i>	Vendor information

## Default Value

None

## Command Mode

Global configuration mode

## Usage Guidelines

The command is used to set vendor information.

## Example

The following example shows how to set the name of vendor to LENOVO in the global configuration mode.

```
Switch_config #dot1x vendor LENOVO
```

## 1.1.24 aaa authentication dot1x

## Syntax

```
aaa authentication dot1x {default | word} method1 [method2...]
```

```
no aaa authentication dot1x { default | word}
```

## Parameters

Parameters	Description
<i>default</i>	Default method Uses the authentication method when command dot1x authentication method does not run.
<i>word</i>	Designate the name of the authentication method
<i>method1 [method2...]</i>	group radius, group tacacs+, local, local-case, none

## Default Value

None

## Command Mode

Global configuration mode

### Usage Guidelines

The method parameter provides a series of methods to authenticate the password of the client host. You'd better adopt the radius as the AAA authentication mode of 802.1x. You can also use the local configuration data for authentication, such as user password saved in the local configuration.

### Example

The following example shows how to configure the dot1x authentication method to RADIUS.

```
Switch_config #aaa authentication dot1x default group radius  
Switch_config #
```

## 1.1.25 debug dot1x errors

### Syntax

To output the error information in running dot1x, run the following command:

**debug dot1x errors**

### Parameters

None

### Default Value

None

### Usage Guidelines

This command is used to export all error information occurred during dot1x running. The error information can help locating the errors.

## 1.1.26 debug dot1x state

### Syntax

To output the status information in running dot1x, run the following command:

**debug dot1x state**

## Parameters

None

## Default Value

None

## Command Mode

Privileged mode

## Usage Guidelines

The following shows the format of information output:

```
2015-3-18 17:40:09 802.1x:AuthSM(g0/1) state Connecting-> Authenticating, event rxResId  
2015-3-18 17:40:09 802.1x:g0/1 Create user for Enter authentication  
2015-3-18 17:40:09 802.1x:BauthSM(g0/1) state Idle-> Response, event authStart  
2015-3-18 17:40:09 802.1x:g0/1 user "myname" denied, Authentication Force Failed  
2015-3-18 17:40:09 802.1x:g0/1 Authentication Fail  
2015-3-18 17:40:09 802.1x:BauthSM(g0/1) state Response-> Fail, event aFail
```

**1.1.27 debug dot1x packet**

## Syntax

To output the packet information in running dot1x, run the following command:

**debug dot1x packet**

## Parameters

None

## Default Value

None

## Command Mode

Privileged mode

## Usage Guidelines

```
2015-3-18 17:40:09 802.1xg0/1 Tx --> Supplicant(0008.74bb.d21f)
EAPOL ver:01, type:00, len:5
EAP code:01, id:03, type:01, len:5
00
2015-3-18 17:40:09 802.1x:g0/1 Rx <-- Supplicant(0008.74bb.d21f)
EAPOL ver:01, type:00, len:10
EAP code:02, id:03, type:01, len:10
62 64 63 6f 6d a5
```

### 1.1.28 show dot1x

#### Syntax

To display the 802.1x configuration information, run the previous following command.

**show dot1x [interface *intf-id* | statistics]**

#### Parameters

Parameters	Description
interface	Displays dot1x interface information.
<i>Intf-id</i>	Stands for a specific physical interface.
statistics	Displays dot1x statistics information.

#### Default Value

None

#### Command Mode

Other modes except the user mode

## Usage Guidelines

This command is used to display the 802.1x configuration information.

#### Example

The following example shows how to display 802.1x configuration information.

```
Switch_config#show dot1x
802.1X Parameters
reAuthen      No
reAuth-Period 3600
```

quiet-Period	60
Tx-Period	30
Supp-timeout	30
Server-timeout	30
reAuth-max	5
max-request	3
authen-type	Eap